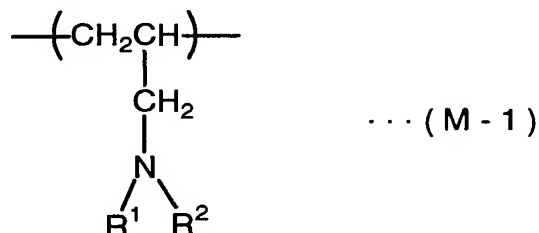


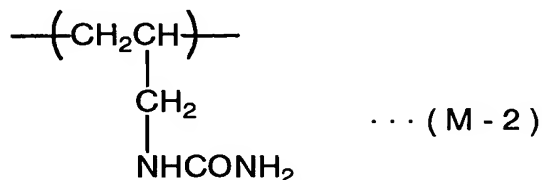
CLAIMS

1. A modified polyallylamine comprising, as an essential component, a unit of the general formula (M-1),

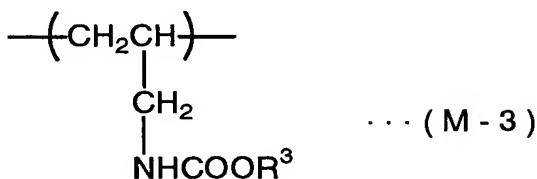


wherein each of R^1 and R^2 is independently an alkyl group having 1 to 4 carbon atoms,

comprising at least one unit selected from units of the formula (M-2),

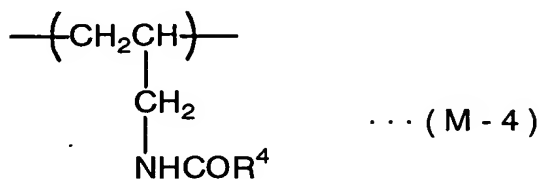


the general formula (M-3),



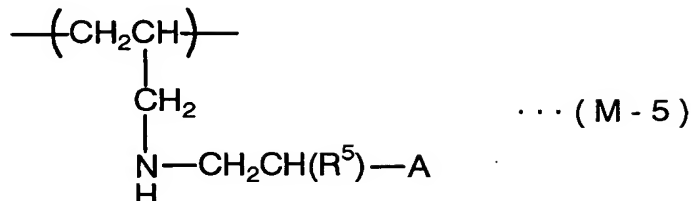
wherein R^3 is an alkyl group having 1 to 12 carbon atoms or an aryl group having 6 to 12 carbon atoms,

the general formula (M-4),

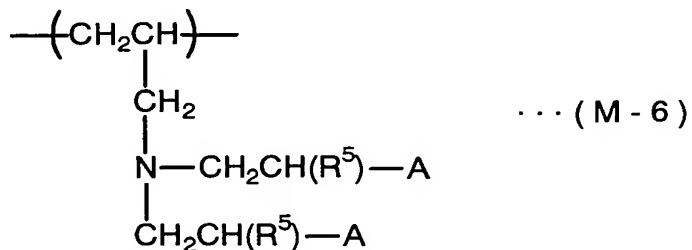


wherein R⁴ is an alkyl group having 1 to 12 carbon atoms,

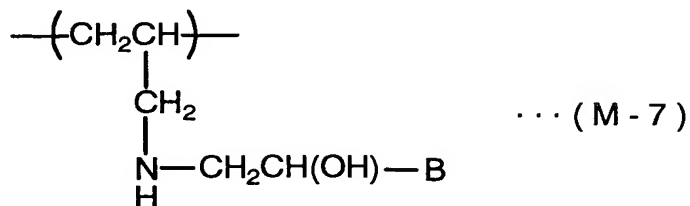
the general formula (M-5),



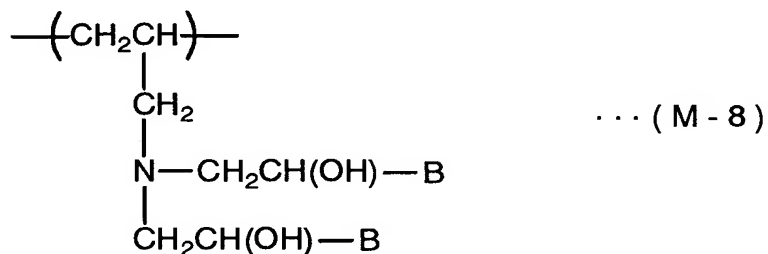
5 wherein R⁵ is a hydrogen atom or methyl and A is
-CONR⁶R⁷, -CN or -COOR⁸, in which each of R⁶ and R⁷ is
independently a hydrogen atom or an alkyl group having 1 to
8 carbon atoms and optionally containing a hydroxyl group,
a keto group, a mono(C₁-C₄ alkyl) amino group, a di(C₁-C₄
10 alkyl) amino group or a tri(C₁-C₄ alkyl) ammonium group, and
R⁶ and R⁷ may bond to each other and form a piperidino or
morpholino group together with a nitrogen atom, and R⁸ is an
alkyl group having 1 to 8 carbon atoms and optionally
containing a hydroxyl group, a keto group, a mono(C₁-C₄
15 alkyl) amino group, a di(C₁-C₄ alkyl) amino group or a
tri(C₁-C₄ alkyl) ammonium group,
the general formula (M-6),



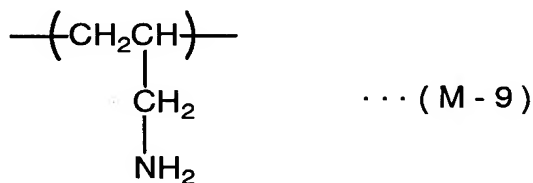
 wherein R⁵ and A are as defined above,
20 the general formula (M-7),



wherein B is an alkyl group having 1 to 8 carbon atoms and optionally containing a hydroxyl group, an alkoxyl or alkenyloxy group having 1 to 4 carbon atoms,
 5 and the general formula (M-8),

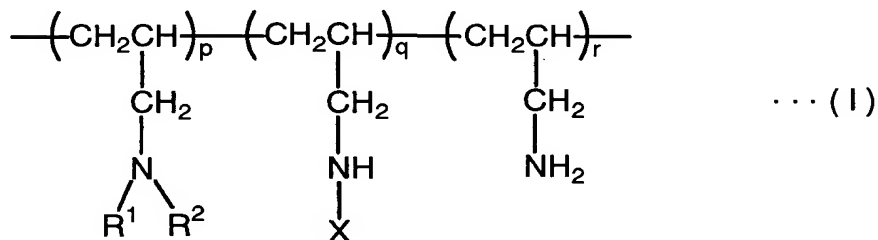


wherein B is as defined as said B,
 and optionally containing a unit of the formula (M-9),



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2. A modified polyallylamine having a structure of the general formula (I),

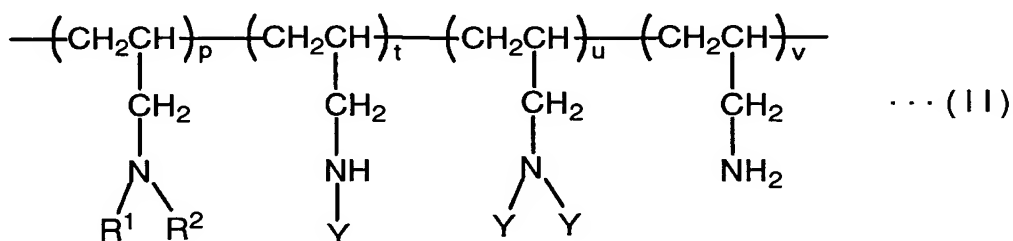


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wherein each of R¹ and R² is independently an alkyl

group having 1 to 4 carbon atoms, X is $-\text{CONH}_2$, $-\text{COOR}^3$, in which R^3 is an alkyl group having 1 to 12 carbon atoms or an aryl group having 6 to 12 carbon atoms, or $-\text{COR}^4$, in which R^4 is an alkyl group having 1 to 12 carbon atoms, each of p and q is independently an integer of 1 or more, and r is 0 or an integer of 1 or more.

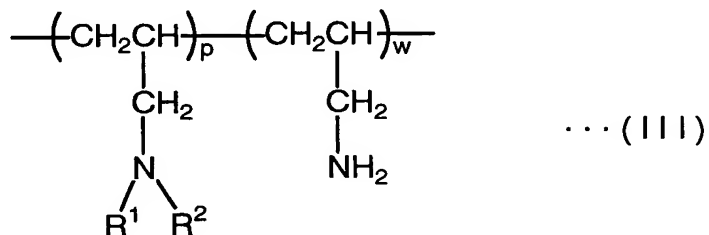
3. A modified polyallylamine having a structure of the general formula (II),



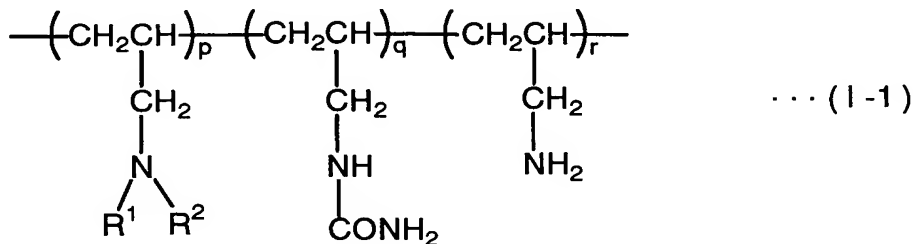
wherein each of R^1 and R^2 is independently an alkyl group having 1 to 4 carbon atoms, Y is $-\text{CH}_2\text{CH}(\text{R}^5)-\text{A}$, in which R^5 is a hydrogen atom or methyl and A is $-\text{CONR}^6\text{R}^7$, $-\text{CN}$ or $-\text{COOR}^8$, in which each of R^6 and R^7 is independently a hydrogen atom or an alkyl group having 1 to 8 carbon atoms and optionally containing a hydroxyl group, a keto group, a mono($\text{C}_1\text{--C}_4$ alkyl) amino group, a di($\text{C}_1\text{--C}_4$ alkyl) amino group or a tri($\text{C}_1\text{--C}_4$ alkyl) ammonium group, R^6 and R^7 may bond to each other to form a piperidino or morpholino group together with a nitrogen atom, and R^8 is an alkyl group having 1 to 8 carbon atoms and optionally containing a hydroxyl group, a keto group, a mono($\text{C}_1\text{--C}_4$ alkyl) amino group, a di($\text{C}_1\text{--C}_4$ alkyl) amino group or a tri($\text{C}_1\text{--C}_4$ alkyl group) ammonium group, or $-\text{CH}_2\text{CH}(\text{OH})-\text{B}$, in which B is an alkyl group having 1 to 8 carbon atoms and optionally

containing a hydroxyl group or an alkoxyl or alkenyloxy group having 1 to 4 carbon atoms, p is an integer of 1 or more, and each of t, u and v is independently 0 or an integer of 1 or more, provided that at least one of t and u is an integer of 1 or more.

4. A process for producing a modified polyallylamine of the general formula (I-1), which comprises reacting a cyanic acid with a copolymer of N,N-dialkylallylamine and an allylamine, represented by the general formula (III),



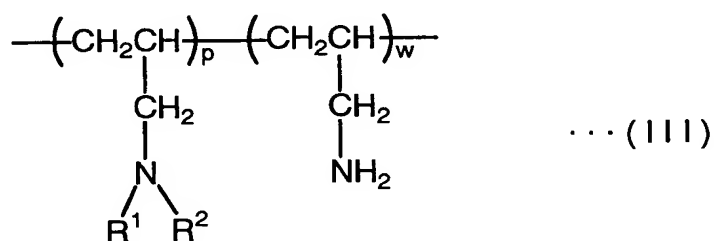
wherein each of R¹ and R² is independently an alkyl group having 1 to 4 carbon atoms and each of p and w is independently an integer of 1 or more, to produce the modified polyallylamine of the general formula (I-1),



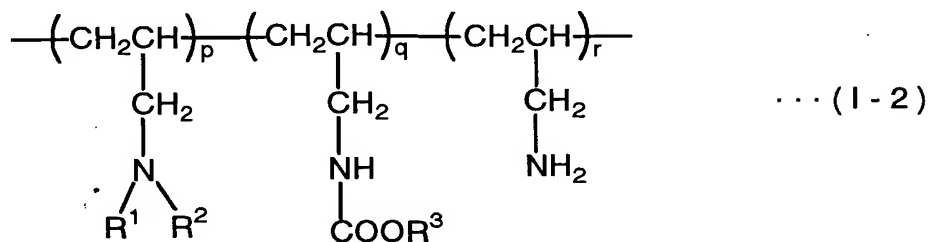
wherein q is an integer of 1 or more, r is 0 or an integer of 1 or more and R¹, R² and p are as defined above.

5. A process for producing a modified polyallylamine

of the general formula (I-2), which comprises reacting an
 alkoxycarbonylation agent having 1 to 12 carbon atoms or an
 aryloxycarbonylation agent having 6 to 12 carbon atoms with
 a copolymer of N,N-dialkylallylamine and an allylamine,
 5 represented by the general formula (III),



wherein each of R¹ and R² is independently an alkyl
 group having 1 to 4 carbon atoms and each of p and w is
 independently an integer of 1 or more,
 10 to produce the modified polyallylamine of the general
 formula (I-2),

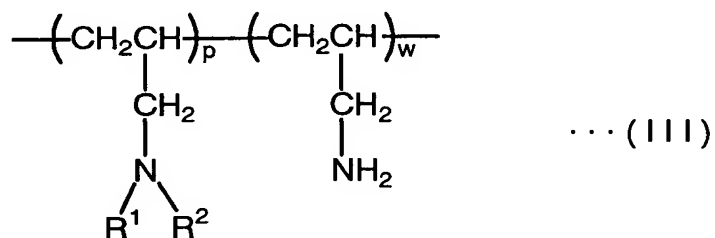


wherein R³ is an alkyl group having 1 to 12 carbon
 atoms or an aryl group having 6 to 12 carbon atoms, q is an
 15 integer of 1 or more, r is 0 or an integer of 1 or more,
 and R¹, R² and p are as defined above.

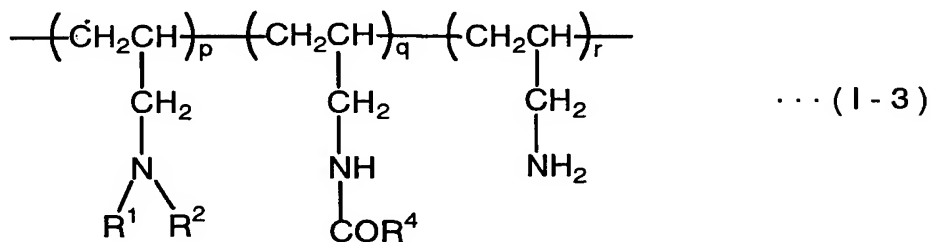
6. The process for producing a modified polyallylamine
 as claimed in claim 5, wherein the alkoxycarbonylation
 20 agent or the aryloxycarbonylation agent is a carbonate
 diester represented by R³O-CO-OR³ in which R³ is an alkyl

group having 1 to 12 carbon atoms or an aryl group having 6 to 12 carbon atoms.

7. A process for producing a modified polyallylamine of the general formula (I-3), which comprises reacting an acylation agent having 1 to 12 carbon atoms with a copolymer of N,N-dialkylallylamine and an allylamine, represented by the general formula (III),



wherein each of R¹ and R² is independently an alkyl group having 1 to 4 carbon atoms and each of p and w is independently an integer of 1 or more, to produce the modified polyallylamine of the general formula (I-3),



wherein R⁴ is an alkyl group having 1 to 12 carbon atoms, q is an integer of 1 or more, r is 0 or an integer of 1 or more, and R¹, R² and p are as defined above.

8. The process for producing a modified polyallylamine as claimed in claim 7, wherein the acylation agent is an

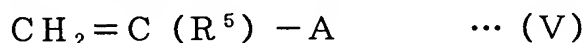
carboxylic anhydride of the general formula (IV),



wherein R^4 is an alkyl group having 1 to 12 carbon atoms.

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9. A process for producing a modified polyallylamine of the general formula (II-1), which comprises reacting an acryl compound of the general formula (V),

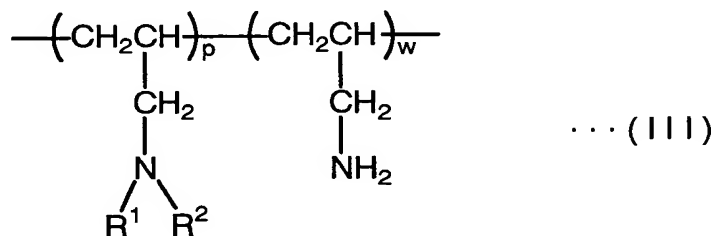


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wherein R^5 is a hydrogen atom or methyl and A is $-CONR^6R^7$, $-CN$ or $-COOR^8$, in which each of R^6 and R^7 is independently a hydrogen atom or an alkyl group having 1 to 8 carbon atoms and optionally containing a hydroxyl group, a keto group, a mono(C_1 - C_4 alkyl) amino group, a di(C_1 - C_4 alkyl) amino group or a tri(C_1 - C_4 alkyl) ammonium group and R^6 and R^7 may bond to each other and form a piperidino or morpholino group together with a nitrogen atom, and R^8 is an alkyl group having 1 to 8 carbon atoms and optionally containing a hydroxyl group, a keto group, a mono(C_1 - C_4 alkyl) amino group, a di(C_1 - C_4 alkyl) amino group or a tri(C_1 - C_4 alkyl) ammonium group, with a copolymer of N,N-dialkylallylamine and an allylamine, represented by the general formula (III),

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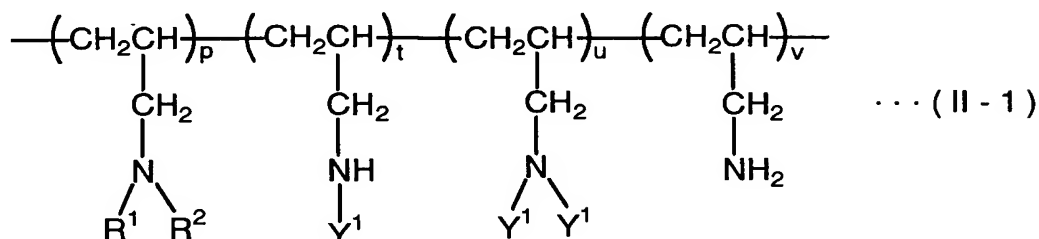
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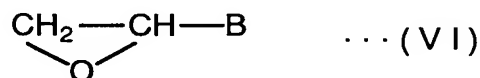
wherein each of R^1 and R^2 is independently an alkyl

group having 1 to 4 carbon atoms and each of p and w is independently an integer of 1 or more, to produce the modified polyallylamine of the general formula (II-1),

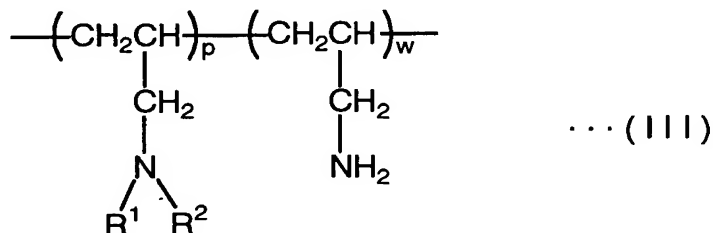


wherein Y^1 is a $-\text{CH}_2\text{CH}(\text{R}^5)-\text{A}$, each of t, u and v is independently 0 or an integer of 1 or more, provided that at least one of t and u is an integer of 1 or more, and R^1 , R^2 , R^5 , A and p are as defined above.

10. A process for producing a modified polyallylamine of the general formula (II-2), which comprises reacting an epoxy compound of the general formula (VI),



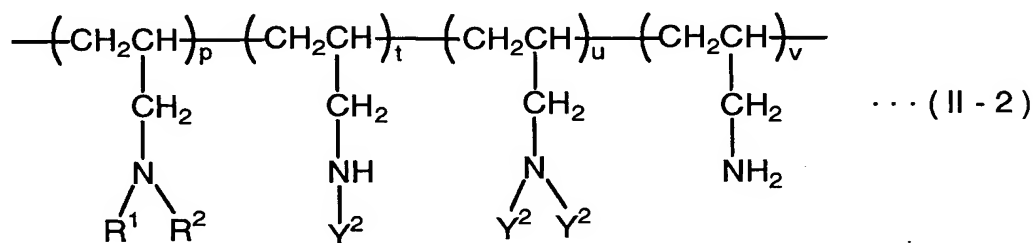
wherein B is an alkyl group having 1 to 8 carbon atoms and optionally containing a hydroxyl group, an alkoxy or alkenyloxy group having 1 to 4 carbon atoms, with a copolymer of N,N-dialkylallylamine and an allylamine, represented by the general formula (III),



wherein each of R^1 and R^2 is independently an alkyl group having 1 to 4 carbon atoms and each of p and w is independently an integer of 1 or more,

to produce the modified polyallylamine of the general

5 formula (II-2),



wherein Y^2 is a $\text{CH}_2\text{CH}(\text{OH})\text{---B}$, each of t , u and v is independently an integer of 1 or more, provided that at least one of t and u is an integer of 1 or more, and R^1 , R^2 ,

10 B and p are as defined above.